

Knowledge Management on Electronic Dental Record at RSGM FKG UNPAD

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Abstract: *The business model at RSGM FKG Unpad is a section between dental healthcare providers and education providers as well as the research. Based on the analysis found one of the important tools that can support these slices aspect is the management of medical records. Dental record file contains records about patient's identity, examination result, treatment, and drug prescribed during the dental service.*

Based on the observation and interview analysis, also supported by literature study there are some problems in the management of medical records that are still using paper based systems, which lead to optimal utilization of knowledge contained in medical records to be used efficiently in decision-making to the level of service even management, education and research.

Business solutions are offered through the Knowledge Management approach, namely by proposing a model line using an electronic medical record system and also application of SECI model which developed by Nonaka and Takeuchi in 1995 about knowledge creation process, namely the displacement cycle of tacit knowledge into explicit and vice versa, knowledge that includes four phases : Socialization, externalization, combination, and internalization. KM approach to health services can occur by extension the perspective of the stakeholders in receiving, processing and communicating in the groove between the health service organization activities of doctors, nurses, administration, education staff, researcher.

Keywords: *Knowledge Management, SECI, Electronic Medical Record .*

1. Introduction

Health sciences and health services are rapidly growing in line with the needs of health care. It is an effort organized by an individu or an organization to care for, improve and recover health or prevent and cure the diseases of individuals, groups and communities (Anwar, 1996).

One of business in the health care is hospital which is defined by the American Hospital

Association as an organization that organizes medical services and nursing care by professionals. Its management is organized, permanent and continuous (Anwar, 1996). It can be concluded that hospital organizes medical services, medical support and nursing care in which sick people are treated (Usri & Moeis, 2007).

The development of health industry should be followed by the development of dental health curriculum to meet the needs of hospitals in Indonesia specially in the field of dental and oral health care. Therefore, the dental hospital is established which specializes in the dental and oral health in each Faculty of Dentistry. Currently there are 11 dental hospital in Indonesia, that current number is increasing every year with the emergence of new dental health education. The task of dental hospital is to implement dental health care which focuses on the medical treatment and recovery with the efforts of improvement and prevention as well as carrying out the referral (Husain, Hasjmy & Akib, 2009).

RSGM FKG Unpad possess a vision that "Making the Dental Hospital Unpad as a service center and the center of development of science, technology, and human resources in the field of dental and oral health which is professionally and modernly managed", then the mission of the Dental Hospital Unpad emphasizes the interest in education and research.

The existing business model is a section between dental health care providers and education providers as well as the research. It is the typical characteristic that distinguishes the dental hospital from other common hospitals. The components of human resources are directors and staff, the medical committee, medical personnel who also have a role as educators in Faculty of Dentistry Unpad. Then there are also administrative personnel, professional students and specialists, employees and technicians. There are two categories in providing the service, namely dental and oral health services by students (professional and specialist organizations) and executive services by general dentists and specialists.

RSGM FKG Unpad has 6 building in an area which consists of facilities and services spread over a number of rooms. It becomes an obstacle in providing the services because patients often have to move from a service facility to another service facility or the room which is located far from another room. For instance, x-rays service facility is divided in two different building. The ease of internal communication among facilities is also not completely covered, so the coordination among the human resources is not efficient yet.

The aspect of service is always associated with quality. Along with the social circumstances in which people are increasingly growing their awareness of quality, it is necessary to improve the quality or the quality of health care that is more oriented to patient satisfaction. It means that hospitals should strive to provide the best service through evaluating and improving the services based on the patient's perspective. Some aspects of health care that can affect the perception of the patients who use health services are activities carried out in the health service, such as a factor of health workers who carry out health services, facilities used in treatment services, medical services and medical support from enforcement diagnosis through measures of treatment and care and administrative services (Pohan, 2006).

The increasing number of patient visits each year is a challenge for RSGM FKG Unpad. It can be used as a reflection of the growing needs of the community to get dental and oral health services. One of efforts in improving the service quality is improving the efficiency of service process flow. One of components that always accompanies the service process is a medical record. Medical record as the note contains a description of the patient's identity, the results of clinical examination, diagnosis, treatment plan, actions and also the attached information on administrative payments. All information during the process of services play an important role in improving the quality of services as well as important information for administrative report, and even in making decisions by management related to financial policies and the procurement of equipment and materials.

2. Literature Review

Knowledge Management

The definition of knowledge begins with an explanation of the data, information and knowledge, as follows (Bergeron, 2003):

- Data is a key element in the formation of information. Basically the data is a record of the facts or the representation of a transaction or event that can be words, numbers or symbols.
- Information is a collection of data that has been analyzed, associated with the

explanation, interpretation and other material associated with the object, event or process.

- Knowledge is information that has been organized, synthesized, summarized or already implying understanding, awareness and understanding.

Knowledge Management is a systematic approach to manage the wealth of knowledge from a new knowledge creation, documentation, until the user settings or the distribution of the knowledge in order to improve the effectiveness of employees in a company or organization (Tjakraatmadja & Lantu, 2006). According to Garfield (2007), there are five key activities of Knowledge Management and its benefits:

- Learning by doing, either from others or from the available information, so they can do something better, prevent problems and make precise decisions. Learning is the essence of Knowledge Management.
- Sharing what has been gained and done, so it can save time and costs and become more effective. It makes their enrichment increase the dissemination of knowledge.
- Utilizing what have learned or created by others to save time and costs.
- Collaborating with others to obtain maximum results in preparation for the future or benefit from another perspective
- Doing innovation in order to be more creative, inventive, and imaginative so it can generate breakthroughs in knowledge that creates a "New Knowledge"

Converting Tacit Knowledge into Explicit Knowledge

Integrating tacit, implicit, explicit and premium knowledge on many levels is a system and mechanism created by KM. That combination empties eventually into the explicit knowledge which can be expressed, documented, and codified. The knowledge at any moment can be used and understood by everyone to apply. Figure 1 illustrates the relationship between tacit and explicit knowledge, as well as facilitate the steps of organization to convert the tacit knowledge into explicit knowledge.

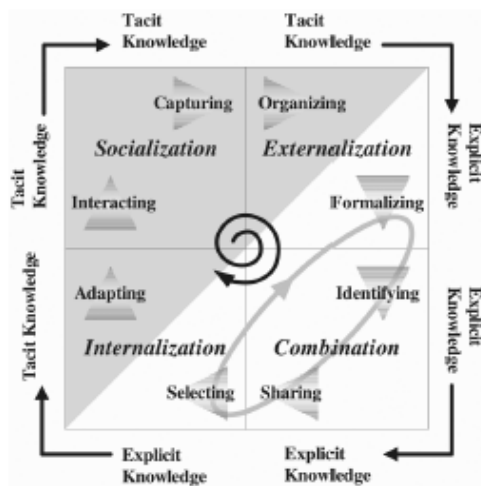


Figure 1. Nonaka and Takeuchi's SECI Model

SECI model shows the organizational knowledge creation occurs through spiral movement by a constant interaction between tacit knowledge and explicit knowledge with the knowledge assets that have an important role in the process of knowledge creation.

There are four process of knowledge creation by Nonaka and Takeuchi (1995), namely:

1. Socialization, the process of converting tacit into tacit knowledge, (referring to the tacit knowledge that is shared among people, such as observation, imitation and practice that occurs without formal discussion)
2. Externalization, the process of converting tacit knowledge into explicit, (referring to the tacit knowledge that is articulated into explicit knowledge and shared paradigms and metaphors through formal discussions)
3. Combination, the process of converting explicit knowledge into explicit, and (referring to the synthesis of multiple sources of explicit knowledge such as in establishing a mission statement, and other strategic documents through formal discussions)
4. Internalization, the process of converting tacit into explicit knowledge (referring to reconnect explicit knowledge to tacit knowledge such as learning through individual reflection)

Tacit knowledge is delivered to others through the process of socialization in teamwork and coaching. The ease of someone contacting colleagues who have competence or expertise in one field (connect people to people) is also important in the organization. Then the knowledge can be accepted and delivered to others, therefore the knowledge become explicit. This process is called externalization. After that, the knowledge, that has

been accepted and absorbed, is systematically arranged and grouped. This stage is called combination. In the end, the explicit knowledge can be learned, understood and developed in accordance with the capabilities of each individual. This process is called internalization. Knowledge that has undergone a process of internalization, back into tacit knowledge which requires to be converted back into explicit knowledge, and so on. Through this cycle, from time to time, the organizational knowledge assets will be more rich and developed.

Electronic Medical Records

Electronic medical record, a system of patient record, is a type of clinical information systems which is aimed at collecting, storing, manipulating, and making essential clinical information become available in giving the patient care. The system focuses on the clinical data, not on the financial or billing information. In addition it can be limited and developed based on the needs that is related to the efficiency and quality improvement of patient care (Tang, 2003).

In 2003, a report from "Institute of Medicine Patient Safety" describes the electronic medical records that involve:

1. The collection of electronic medical information of patients
2. Electronic access for patients in getting information
3. Providing knowledge and supports systems in decision making (improving quality, security, and efficiency of patient care), and
4. Support for efficient process for health care

In IOM guidance written by Tang (2003), there are eight main functions must be possessed by electronic medical records:

1. Data of health information. A direct access for key information, such as diagnoses, allergies, lab test results, and medications. It will increase the ability of providers to make efficient clinical decisions at the right time.
2. Management Results. The ability of providers to participate in patient care in multiple settings to access the new and old test results and it will improve patient safety and effectiveness of treatment.
3. Supply information of drugs, tools and consumables. The ability to input and save orders for prescriptions, tests, and other services in the computer-based system that should improve the access to be readable, reduce duplication, and improve the decision making.

4. Ease in making decisions. Using reminders, instructions, and sign, a computerized decision in supporting system will help improve compliance with clinical best practices, ensure regular checkups and other preventive practices, identify potential drug interactions, and facilitate diagnosis and treatment.
5. Security of communication and connectivity. Efficient, secure, and easily accessible communication between providers and patients will improve the treatment, improve the timeliness of diagnosis and treatment, and reduce the frequency of side effects.
6. Support on the patient. A tool that gives patients access to their medical records, provide interactive patient education, and help them carry out monitoring during therapy at home and self-testing that improves the control of chronic conditions, such as diabetes.
7. Administration process. Computerized administrative tools, such as the scheduling system, will greatly improve hospitals and clinics to be able to provide more timely services to patients.
8. Report. Data storage of electronic medical records using data standard will enable health care organizations to respond faster to the needs of relevant institutions, including those that support patient safety and disease surveillance.

researcher collects open-ended. emerging data with the primary intent of developing themes from the data. (Creswell, 2012). Data collection method uses Literature Review in which researchers read various references as the basis of the analysis and Primary Data Collection that consists of interviews and observations.

Data analysis method is qualitative data analysis uses triangulation which helps the validity of data through combining the data sources or using different data collection method. Triangulation is a method of cross-checking data from multiple sources. The cross-checking data is commonly used in triangulation technique. It the best way to eliminate differences in the construction of reality that exist in the context of a study when collecting data about the various events and relationships of the various views (Creswell, 2012).

6. Analysis and Result

KM aim is generally to possess ability to capture, control, save and utilize knowledge which is individual or gorup experiences in the organization, thus it can be used by individuals or other gorups within the organization Another aim of KM implementation is the acceleration in the learning process which can be accelerated by a codification strategy during the process of capturing knowledge. Knowledge management covering wide implementation, Evidence Based Miedicine (EBM) is one of KM scope in the field of health care. It is a treatment approach based on the treatment experiences that have been done and scientifically recognized. EBM is structurally conducted based on a collection of experiences and explicit and knowledge codified (Bali & Dwivedi, 2010).

Every program of KM implementation should begin with KM Objective. It is a goal that wants to be achieved by implementing knowledge management. There are actually 15 objectives of KM that can be chosen then reduced, based on priority level that should be addressed, to 3 main objectives of KM (Garfield, 2007).

5. Research Methodology

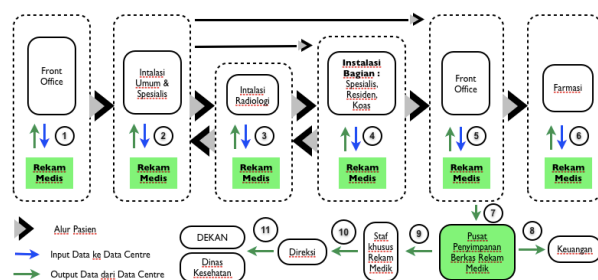


Figure 2. Illustration flow medical record at RSGM FKG UNPAD

The methodology used in this study is qualitative methods which is the inquirer often makes knowledge claims based primarily on constructivist perspectives or advocacy/participatory perspectives or both. It also uses strategies of inquiry such as narratives, phenomenologies, ethnographies, grounded theory studies, or case studies. The

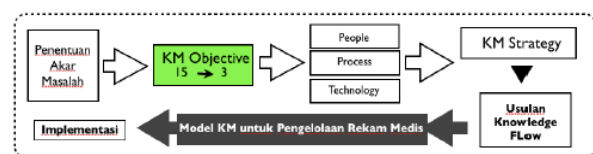


Figure 3. Defining KM Objective

Based on analysis of observations and interviews, There are 15 KM Objective at the Hospital FKG Unpad:

Table 1. KM Objective di RSGM FKG Unpad

No	The Challenges of KM Objective
1	Capable of doing the decision aming faster and better in determining the diagnosis, the investigation results, treatment plan, and budget of tools and materials.
2	Capable of providing the convenience for doctors, students, nurses and administrative personnel in finding information and relevant resources contained in the medical record file.
3	Capable of reusing the available ideas/documents and expertise with the constant quality improvement.
4	Capable of avoiding the repeated actions
5	Capable of avoiding the repeated mistakes
6	Capable of gaining the advantages from the available expertise and experiences
7	The important communication of information can be delivered fast
8	Capable of improving the standard on process and procedure that are repeatedly conducted
9	Providing method, tool, technique and example
10	Enabling the available human resources that possess rare expertise
11	Capable of showing how knowledge can be profitable for consuments
12	Accelerating the service for consuments
13	Enabling the organization to grow and develop
14	Making each solution in organizational activities can be always reuseable
15	Capable of stimulating innovation and organizational growth

According to the 15 Objectives of KM, the deep analysis is conducted through interviews in December 2010 with interviewees in RSGM FKG Unpad, such as directors, doctors, students and patients. Based analysis, the improvement of service aspect through a KM approach is urgently needed, so that the aspect of education, research and management will be also affected by the improvement. In the interview with the management, the questions also cover 15 objectives of KM to stimulate objectively what is important in the development of KM, then three objectives is gained that is considered as the important aspects related to treatment, namely:

1. Capable of doing the decision making faster and better in determining the diagnosis, the investigation results, and treatment plan
2. Capable of providing the convenience for doctors, students, nurses and administrative personnel in finding information and relevant resources contained in the medical record file.

3. Capable of reusing the available ideas/documents and expertise with the constant quality improvement.

7. Conclusions

KM flow that is implemented at RSGM FKG Unpad is arranged based on the Garfiled theory (2007), which requires five ways to determine the required knowledge, namely:

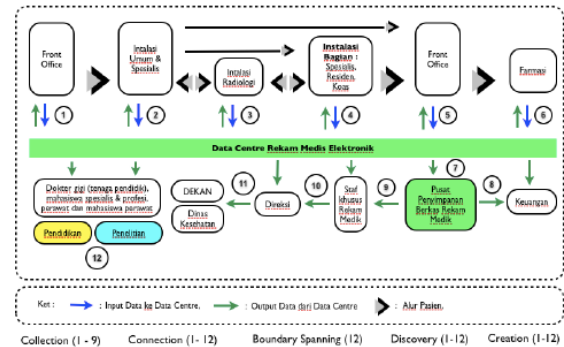


Figure 4. The KM-Based Management Flow of Electronic Medical Record

While SECI model shows the organizational knowledge creation occurs through spiral movement by a constant interaction between tacit knowledge and explicit knowledge with the knowledge assets that have an important role in the process of knowledge creation.

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